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**Published:**

— *with international search report*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Declaration under Rule 4.17:**

— *of inventorship (Rule 4.17(iv)) for US only*

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SG03/00232

**A. CLASSIFICATION OF SUBJECT MATTER**Int. Cl. <sup>7</sup>: G10G 1/04, 3/04

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

USPTO, DWPI, INSPEC, internet (IPC: G10G 1/04, 3/04, US: 84/-, music, hummin, query by hummin, transcribe, score, note, pitch, envelope, attack, decay, estimation, detection, recognition, clustering, etc.)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,038,658 (TSURUTA et al), 13 August 1991 the whole document	1-9, 19-37, 47, 49-58
Y	(when combined with US 5,874,686, US 6,437,227, WO 01/11496 or Smith et al)	22-24, 50-52
X	US 5,986,199 (PEEVERS), 16 November 1999	1-9, 19-37, 47, 49-58
Y	the whole document (in particular, column 4, lines 45-59) (when combined with US 5,874,686, US 6,437,227, WO 01/11496 or Smith et al)	22-24, 50-52
X, P	US 6,476,308 B1. (ZHANG), 5 November 2002 the whole document (in particular, column 3, line 26 – column 4, line 38)	1-9, 19-37, 47, 49-58

 Further documents are listed in the continuation of Box C See patent family annex

* Special categories of cited documents:		
"A"	document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E"	earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 24 October 2003	Date of mailing of the international search report - 4 DEC 2003
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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SG03/00232

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,874,686 (GHIAS et al), 23 February 1999 the whole document (when combined with US 5,038,658 or US 5,986,199)	22-24, 50-52
Y	US 6,437,227 B1 (THEIMER), 20 August 2002 the whole document (when combined with US 5,038,658 or US 5,986,199)	22-24, 50-52
Y	WO 01/11496 A2 (SIBELIUS SOFTWARE LTD.) 15 February 2001 the whole document (when combined with US 5,038,658 or US 5,986,199)	22-24, 50-52
Y	Smith, L. A. et al, <i>Music Information Retrieval Using Audio Input</i> . In: Proc. AAAI Spring Symposium on Intelligent Integration and Use of Text, Image, Video, and Audio Corpora, 1997 <URL: <a href="http://www.cs.waikato.ac.nz/~ihw/papers/97LAS-RJM-IHW-Music-Info.pdf">http://www.cs.waikato.ac.nz/~ihw/papers/97LAS-RJM-IHW-Music-Info.pdf</a> > the whole document (when combined with US 5,038,658 or US 5,986,199)	22-24, 50-52
A	Li, J. et al, <i>Mandarin Four-Tone Recognition with the Fuzzy C-Means Algorithm</i> . In: Proc. IEEE International Fuzzy Systems Conference, 1999 the whole document (section 3 in particular)	10-18, 38-46, 48

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/SG03/00232

## Box I Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos :

because they relate to subject matter not required to be searched by this Authority, namely:

2.  Claims Nos :

because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3.  Claims Nos :

because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

## Box II Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See extra sheet.

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4.  No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- The additional search fees were accompanied by the applicant's protest.  
 No protest accompanied the payment of additional search fees.

**INTERNATIONAL SEARCH REPORT**

International application No.  
**PCT/SG03/00232**

**Supplemental Box**

(To be used when the space in any of Boxes I to VIII is not sufficient)

**Continuation of Box No: II**

The international application does not comply with the requirements of unity of invention because it does not relate to a single invention or inventive concept only. In coming to this conclusion, the International Searching Authority has found that there are three invention:

- Claims 1-4, 19-32, 47, 49-58. The detection of pitch values of marked musical notes is considered to be a first “special technical feature.”
- Claims 5-9, 33-37. The extraction of note markers from the gradient function of a sound signal’s envelope is a second “special technical feature.”
- Claims 10-18, 38-46, 48. The detection of pitch values by clustering is a third “special technical feature.”

Since these groups of claims do not share any of the special technical features identified above, a “technical relationship” between the inventions, as defined in PCT rule 13.2, does not exist. Hence the claims lack unity.

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/SG03/00232

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member			
US 5038658	AU	3079689		EP	0331107		JP 1219621
	JP	1219622		JP	1219623		JP 1219624
	JP	1219625		JP	1219626		JP 1219627
	JP	1219628		JP	1219629		JP 1219630
	JP	1219631		JP	1219632		JP 1219633
	JP	1219634		JP	1219635		JP 1219636
	JP	1219637		JP	1219638		JP 1219888
	JP	1219889					
US 5986199	NONE						
US 6476308	JP	2003140647					
US 5874686	NONE						
US 6437227	DE	19948974		EP	1093109		
WO 0111496	AU	6456800		US	2003023421		

END OF ANNEX